

**SONIC STAR
PROPERTIES
LIMITED**

**27-32 MARKET
PLACE AND 173-175
FRIAR STREET
READING**

**AIR QUALITY
ASSESSMENT**

DECEMBER 2020

FINAL REPORT

2211W-SEC-00002-02

SONIC STAR PROPERTIES LIMITED
27-32 MARKET PLACE AND 173-175 FRIAR STREET READING
AIR QUALITY ASSESSMENT
FINAL REPORT
DOCUMENT REFERENCE: 2211W-SEC-00002-02

REVIEW AND AUTHORISATION			
Authored By Kerrie Baggs	Position Senior Environmental Consultant	Signature 	Date 13/10/2020
Reviewed By Alaric Lester	Position Associate	Signature 	Date 13/10/2020
Checked By Alaric Lester	Position Associate	Signature 	Date 13/10/2020
Approved By Patrick Williams	Position Director	Signature 	Date 14/10/2020

AMENDMENT HISTORY			
Issue	Status	Description	Date
01	Draft	Draft for client review	14/10/2020
02	Final	Final Issue	08/01/2021

This report has been prepared using all reasonable skill and care within the resources agreed by the client. No responsibility is accepted for matters outside the terms and scope of the agreement under which this report has been prepared. Similarly no responsibility in any form is accepted for third party use of this report or parts thereof, the contents of which are confidential to the client.



Southdowns Environmental Consultants Ltd

HEAD OFFICE: 16 Station Street, Lewes, East Sussex, BN7 2DB, UK Tel: +44 (0)1273 488186

LONDON OFFICE: 29 Warren Street, London, W1T 5NE, UK Tel: +44 (0)203 9590899

enquiries@southdowns.eu.com www.southdowns.eu.com

Registered in England and Wales at Suite A3, 16 Station Street, Lewes, East Sussex BN7 2DB Registration No: 3150111 VAT No: GB 673947486



CONTENTS	PAGE NO.
1. INTRODUCTION	1
1.1 Background	1
1.2 Report Structure	1
2. SITE DETAILS	2
2.1 Site Description	2
2.2 Proposed Development	2
2.3 Sensitive Receptors	2
3. AIR QUALITY POLICY, GUIDANCE AND CRITERIA	4
3.1 Air Quality, Dust and Emissions	4
3.2 EU and National Air Quality Policy and Guidance	4
3.3 Local Air Quality Policy and Guidance	6
3.4 Non-Statutory Guidance	8
4. ASSESSMENT METHODOLOGY	10
4.1 Assessment Approach	10
4.2 Baseline Conditions	10
4.3 Construction Dust	10
4.4 Screening Criteria	10
5. BASELINE CONDITIONS	11
5.1 Local Air Quality	11
5.2 Monitoring	11
5.3 Diffusion Tube Sites	12
5.4 Background Maps	12
5.5 Summary of Baseline Conditions	13
6. CONSTRUCTION IMPACTS	15
6.1 Methodology	15
6.2 EPUK Screening for Construction Traffic	15
6.3 Dust and Emissions Screening	15
6.4 Magnitude of Dust Emissions	15
6.5 Sensitivity of the Area	16
6.6 Dust Risk	16
6.7 Mitigation	17
6.8 Residual Impacts	17
7. OPERATIONAL IMPACTS	18
7.1 Methodology	18
7.2 EPUK Screening	18
7.3 New Receptors	18
8. MITIGATION	19
8.1 Construction	19



8.2 Operational	21
9. CONCLUSIONS	22
10. REFERENCES	23

APPENDIX A – FIGURES



1. INTRODUCTION

1.1 Background

- 1.1.1 Southdowns Environmental Consultants Ltd (Southdowns) was commissioned by Sonic Star Properties Limited (Sonic) in August 2020 to produce an air quality assessment for a proposed mixed-use development at 27-32 Market Place and 173-175 Friar Street, Reading.
- 1.1.2 This assessment has been prepared to determine the likely air quality impacts from the redevelopment of the site on existing and introduced receptors, to accompany a planning application by Sonic Star Properties.
- 1.1.3 This document has been prepared in accordance with the principles and requirements of the Institute of Air Quality Management and EPUK's guidance for '*Land-use Planning & Development Control: Planning for Air Quality*' [1].

1.2 Report Structure

- 1.2.1 Details of the site and the proposed scheme are presented in the following section of this report. Relevant air quality policy and guidance are outlined in Section 3 and the assessment methodology is detailed in Section 4. The existing baseline conditions are presented in Section 5 and the impacts from construction and operation are assessed in Sections 6 and 7, respectively. Appropriate mitigation measures are discussed in Section 8 and the assessment is summarised in Section 9. Figures are presented separately in Appendix A.



2. SITE DETAILS

2.1 Site Description

- 2.1.1 The development site is located in Reading town centre, adjoined to the immediate south and west by a mixture of commercial and retail buildings. The development site is bounded by Friar Street and the Town Hall Square to the north and Market Place to the east. Reading train station is approximately 350 m to the north and the A33 is approximately 500 m to the west of the development site.
- 2.1.2 The development site comprises two separate buildings, 173-175 Friar Street (the former Bristol and West Arcade/Brook Henderson House), to the south of Town Hall Square, and 27-32 Market Place, to the west of Market Place.

2.2 Proposed Development

- 2.2.1 The proposed development involves the demolition of the existing 173-175 Friar Street unit and construction of a 182 room hotel. 27-32 Market Place will undergo refurbishment and remodelling and will comprise retail and residential space.
- 2.2.2 The proposed hotel development comprises eight stories plus basement level. The basement level will include a plant room, offices, changing rooms, toilets and a staff cafeteria. The ground floor will include refuse space, offices, foyer, toilets, a kitchen and a dining area. The hotel rooms will be situated on the first to seventh floors.
- 2.2.3 The proposed redevelopment at 27-32 Market Place will comprise four stories plus basement level. The basement level will include toilets, plant rooms, storage and ancillary retail units. The ground floor will include retail units and cycle storage and the first to third floors will comprise eight residential units.
- 2.2.4 Subject to discussions with operators, construction works are programmed to be completed within approximately two years from commencement.
- 2.2.5 The site location is shown in Figure A1 of Appendix A and the proposed floor plans are shown in Figures A2 to A15.

2.3 Sensitive Receptors

- 2.3.1 Locations where people or wildlife may be adversely affected by changes in air quality or dust soiling are considered as relevant receptors for air quality. Receptors introduced by the proposed development are also relevant.
- 2.3.2 For dust soiling, high-sensitivity receptors may include both residential and ecological receptors, whilst medium- to low-sensitivity receptors may include amenity areas and workplaces.
- 2.3.3 There are a number of residential receptors in the vicinity which could be affected by changes in air quality arising from construction and demolition activities associated with the development. Commercial and industrial premises in the area may also be sensitive to dust.
- 2.3.4 The nearest existing receptors are commercial and retail businesses. However, the possible presence of residential receptors within 20m of the site, on the higher floors of the adjacent buildings, cannot be excluded. These cannot be confirmed through interrogation of street mapping.



- 2.3.5 Saint Laurence Church is located approximately 20 m to the north. A plan showing the location of the development site in relation to sensitive receptors is presented in Figure A16 of Appendix A.
- 2.3.6 The proposed development will introduce residential and commercial receptors to the area, which are considered as part of this assessment.
- 2.3.7 No ecological receptors have been identified within 200 m of the development site. Therefore, ecological receptors have been scoped out of this assessment.



3. AIR QUALITY POLICY, GUIDANCE AND CRITERIA

3.1 Air Quality, Dust and Emissions

- 3.1.1 Atmospheric pollutants of general concern associated with the impacts of developments on human receptors are nitrogen dioxide (NO₂) and particulate matter (PM).
- 3.1.2 NO₂ is produced through the combustion of fossil fuels, used for transport and energy supply. Emissions of oxides of nitrogen (NO_x) from exhausts comprise nitric oxide (NO) and NO₂. NO undergoes oxidation in the atmosphere to form NO₂. High concentrations of NO₂ can cause lung inflammation, shortness of breath and coughing, and reduced immunity to lung infections like bronchitis.
- 3.1.3 PM can result directly as emissions from local sources (primary), or further afield, often having originated as other pollutants and reformed in the atmosphere (secondary). Primary sources of particulates are of most relevance to this assessment and can include emissions from combustion processes and dust from construction activities. Exposure to high concentrations of particulate matter can cause respiratory and cardiovascular illness and even death. PM₁₀ is defined as a mass fraction of airborne particulates with an aerodynamic diameter of 10 microns (µm) or less, whilst PM_{2.5} is defined as a mass fraction of airborne particulates with an aerodynamic diameter of 2.5 microns or less. PM₁₀ and PM_{2.5} are respirable and can be drawn deep into the lungs and cause health problems. The fraction of dust that is larger than 10 µm is filtered by the nose and throat.

3.2 EU and National Air Quality Policy and Guidance

- 3.2.1 The EU Air Quality Directive (Directive 2008/50/EC) [2] came into force in June 2008, and was transposed into legislation in England, Wales, Scotland and Northern Ireland in the Air Quality Standards Regulations 2010 [3], since amended by the Air Quality Standards (Amendment) Regulations 2016 [4]. The Directive introduced legally-binding targets for national governments to reduce air pollution to levels at which no or minimal effects on human health are likely to occur. The obligation to meet the requirements of the Directive falls primarily upon the Secretary of State for the Environment in England, and appropriate Ministers in the Devolved Administrations, who are designated as the appropriate “competent authority”. Although the UK has left the EU, EU legislation continues to apply during the transition period.
- 3.2.2 Defra's *Air Quality Plan for Nitrogen Dioxide (NO₂) in UK (2017)* [5] details the government's plan for reducing roadside NO₂ levels and achieving EU limit values. A supplement to the plan was published in October 2018.
- 3.2.3 The Air Quality (England) Regulations 2015 [6] define air quality ‘objectives’ for a number of key pollutants. The air quality objectives are set at a range of different levels and averaging times for different pollutants.
- 3.2.4 The NO₂ and PM objectives are summarised in Table 3.1 overleaf.
- 3.2.5 The annual mean (long-term) objective applies at locations where individuals might be expected to spend a large majority of their time, for example residential properties. In the case of the hourly mean (short-term), this applies at locations where people might reasonably be expected to spend at least an hour (such as outdoor spaces and leisure areas).



Pollutant	Air Quality Objectives		Date to be Achieved By
NO ₂	40 µg/m ³	Annual mean	31 December 2005
	200 µg/m ³ not to be exceeded more than 18 hours in a year	Hourly mean	31 December 2005
PM ₁₀	50 µg/m ³ not to be exceeded more than 35 times a year	24-hour mean	31 December 2004
	40 µg/m ³	Annual mean	31 December 2004
PM _{2.5}	25 µg/m ³	Annual mean	2020 (but not in UKAQS)
	15% reduction urban background	Annual mean	2010-2020

TABLE 3.1: SUMMARY OF UK AIR QUALITY OBJECTIVES FOR NO₂, PM₁₀ AND PM_{2.5} FOR PROTECTION OF HUMAN HEALTH

- 3.2.6 The Environment Act 1995 [7] introduced the requirement for local authority management of air quality. Part IV of the Act details the duties of local authorities in carrying out their local air quality management (LAQM) responsibilities. The duties include the requirement for review and assessment of air quality and production of regular Updating and Screening Assessments (USA) and Progress Reports.
- 3.2.7 The Act also requires the preparation of a national air quality strategy, setting health-based air quality objectives for specified pollutants. The current version is the Clean Air Strategy 2019 [8]. It sets out action that UK government will take to improve air quality, with a focus on PM_{2.5}, ammonia, NO_x and sulphur dioxide.
- 3.2.8 The Environmental Protection Act 1990 (EPA) [9] deals with statutory nuisance. Nuisance caused by dust is regulated by the statutory nuisance provisions under Part III and is defined in s.79(1)(d) as: *“Any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance”*.
- 3.2.9 Statutory nuisance is not intended to secure a high level of amenity but rather to act as a basic safeguard on emissions. The perpetrator of any alleged nuisance has a defence of best practicable means (BPM), which provides a basis for balancing the interests of the site and residents.
- 3.2.10 There are no UK standards or statutory guidance relating to deposited dust and nuisance, although a deposition rate of 200 mg/m²/day is often used as a threshold for potentially significant nuisance effects.
- 3.2.11 The Clean Air Act 1993 (CAA) [10] details the legislative requirements for the heights of chimneys and flues where the burn rates exceed certain criteria. For appliances fuelled by gaseous matter the relevant criterion value is 366.4kW.
- 3.2.12 The National Planning Policy Framework (NPPF) was first published in 2012 and subsequently updated in July 2018, February 2019 and June 2019 [11]. Paragraph 181 states: *“Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the*



presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."

3.2.13 The roles of the planning authority and pollution control authorities are defined in paragraph 183: *"The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."*

3.2.14 The National Planning Practice Guidance (NPPG) [12] provides guiding principles on how planning can take into account of the impact of new development on air quality. It includes guidance on:

- air quality considerations for planning;
- plan-making and air quality;
- air quality and neighbourhood planning;
- available information;
- when air quality considerations could be relevant to development planning;
- specific issues when assessing air quality impacts;
- required detail for air quality assessments; and
- mitigating air quality impacts.

3.2.15 The guidance provides a flow chart detailing the process that should be followed in determining an application. It indicates that an application should proceed to decision with appropriate planning conditions or obligations if the proposed development, with mitigation in place, would not lead to an unacceptable risk from air pollution, prevent sustained compliance with EU limit values or fail to comply with the requirements of the Habitats Regulations [13].

3.3 Local Air Quality Policy and Guidance

3.3.1 Reading's Local Plan [14] was adopted in November 2019 and replaces previous development plans including the Core Strategy adopted in 2008 and amended in 2015. The Reading Local Plan sets out the policies on how Reading will develop up to 2036. Reading's policies relating to air quality within the Local Plan includes EN15: Air Quality, which states:

"Development should have regard to the need to improve air quality and reduce the effects of poor air quality."



"i. Development that would detrimentally affect air quality will not be permitted unless the effect is to be mitigated. The following criteria should be taken into account:

- "Whether the proposal, including when combined with the cumulative effect of other developments already permitted, would worsen air quality;*
- "Whether the development is within, or accessed via, an Air Quality Management Area; and*
- "Whether it can be demonstrated that a local worsening in air quality that would not detrimentally affect human health or the environment would be offset by an overall improvement in air quality, for instance through reduction in the need to travel.*

"ii. Where a development would introduce sensitive uses (such as residential, schools and nurseries, hospitals, care facilities) into, or intensify such uses within, an Air Quality Management Area, detrimental effects on that use will be mitigated. Mitigation measures should be detailed in any planning application. If there are significant detrimental effects that cannot be mitigated, the application should be refused.

"iii. Where required, planning obligations will be used to secure contributions to measures to tackle poor air quality or for air quality monitoring."

3.3.2 Paragraph 4.2.81 of the Reading Local Plan states that an Air Quality Assessment (AQA) may be required to accompany a planning application. The requirement for an assessment is dependent on the nature and location of the development, but may be required if they are:

"...major development (10 dwellings or 1000m²) located within or accessed by the Air Quality Management Area (AQMA) and:

- "Would lead to a material increase in congestion or HGVs;*
- "Would include significant amounts of car parking, for example 100 spaces, or would significantly increase current provision, for example by 25%;*
- "Would emit air pollutants that would affect sensitive receptors, including areas of biodiversity importance such as priority habitats; or*
- "...a development of any scale would locate new sensitive receptors, such as residential, in areas of particularly poor air quality, such as on the façade of a very busy road."*

3.3.3 As outlined in 4.2.80 of the Plan, the policy aims to ensure that development within Reading does not lead to a net increase in emissions and that any increased exposure in the poorest areas or AQMA will be accompanied with appropriate mitigation measures, with given examples including:

- siting habitable rooms back from busy roads or the façade fronting the pollution source;
- limiting residential accommodation to higher floors;
- restrictions in car access and/or parking;



- planting and NO₂ absorbent paving; or
 - low emissions strategies.
- 3.3.4 Reading Borough Council (RBC) is required to review and assess its air quality at regular intervals. In September 2006, RBC declared six AQMAs, which were replaced with a single management area in 2009.
- 3.3.5 An updated RBC Air Quality Action Plan [15] was published by the Council in 2016. The Plan outlines measures which will be employed to reduce airborne pollutant concentrations in the Reading AQMA. Measures include:
- cycle route infrastructure improvements;
 - ensuring that future development does not result in any further deterioration of air quality and where possible, results in an improvement in overall environmental quality; and
 - increasing business participation in reducing emissions through cycle to work schemes, reducing building energy use, low emission delivery vehicles and reducing emissions from idling vehicles at hotspot locations within the AQMA.

3.4 Non-Statutory Guidance

- 3.4.1 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have produced a document entitled: *Land-Use Planning & Development Control: Planning for Air Quality* [1] that provides guidance on how to ensure that air quality is properly accounted for in the development control process. This guidance provides advice on describing air quality impacts and assessing their significance.
- 3.4.2 This document advises: “...*arriving at a decision about a specific proposed development the local planning authority is required to achieve a balance between economic, social and environmental considerations.*” The document also provides descriptors for magnitude of change, receptor sensitivity and the process for assessment of significance. This guidance is for developers, in the production of air quality assessments, and for reviewers.
- 3.4.3 The Institute of Air Quality Management (IAQM) has published specific guidance on the assessment and mitigation of dust impacts from demolition and construction site activities [16]. The impacts naturally depend on any incorporated mitigation and the emphasis in these guidelines is on classifying the risk of dust impacts from a site as a basis for the identification of mitigation that is commensurate with such risk.
- 3.4.4 Guidance on the likely risk of soiling, health effects and effects on the natural environment from dust produced during demolition, earthworks, construction and trackout activities is provided in the guidelines. Recommended measures for controlling dust and emissions through site-specific mitigation and monitoring procedures are also presented in this IAQM document, including those associated with NRMM.
- 3.4.5 In summary, and as indicated in the IAQM document, the risk of dust emissions from a demolition/construction site causing loss of amenity, health or ecological impacts is related to: the activities being undertaken (demolition, number of vehicles and plant etc.); the duration of these activities; the size of the site; the meteorological conditions (wind speed,



direction and rainfall); the proximity of receptors to the activities; the adequacy of the mitigation measures applied to reduce or eliminate dust; and the sensitivity of the receptors to dust.



4. ASSESSMENT METHODOLOGY

4.1 Assessment Approach

4.1.1 This air quality assessment has been produced using the information available and procedures as follows:

- i. consultation with RBC (emailed 13/10/20) to agree the methodology to be used in this assessment;
- ii. review of RBC's 2020 Annual Status Report [17], LAQM data collected by RBC and predicted NO₂ Defra's background maps [18];
- iii. consideration of the local environment to identify potentially sensitive receptors, both existing and proposed, that could be affected by changes in air quality as a result of the construction and operation of the proposed development;
- iv. comparison of NO₂ and PM₁₀ baseline data (following task 2) with UK air quality objectives; and
- v. qualitative assessment of the potential dust and air quality impacts of the demolition and construction activities and control measures considered necessary during these activities.

4.2 Baseline Conditions

4.2.1 Baseline conditions at and around the development site have been considered using RBC's 2020 Annual Status Report for 2019, LAQM data and Defra's background maps.

4.3 Construction Dust

4.3.1 A qualitative assessment of the dust and air quality impacts from construction has been undertaken to establish the risk and appropriate mitigation to prevent effects at local receptors. This was undertaken in line with the IAQM document 'Guidance on the assessment of dust from demolition and construction' [16].

4.4 Screening Criteria

4.4.1 The assessment follows the procedure as defined in the EPUK guidance, using published information in the public domain.

4.4.2 The EPUK guidance provides criteria for establishing whether a development will require an air quality assessment. The criteria are set out in a two-stage approach:

4.4.3 In order to meet the criteria in Stage 1, the development must have:

- 10 or more residential units or a site area of more than 0.5 ha; or
- more than 1,000 m² of floor space for all other uses or a site area greater than 1 ha.

4.4.4 This must be combined with either of the following:

- more than 10 parking spaces within the development; or
- the development has a centralised energy facility or combustion process.

4.4.5 The proposed development will be extending the footprint beyond the current footprint. Therefore, baseline concentrations have been considered in regard to sensitive receptors introduced by the proposed redevelopment.



5. BASELINE CONDITIONS

5.1 Local Air Quality

- 5.1.1 The site is located within the administrative boundary of RBC. RBC conducts air quality monitoring at various locations within the town as part of its LAQM duties.
- 5.1.2 In August 2009, an area covering Reading Town Centre, main arterial roads and rail line were designated as an AQMA due to exceedances of the annual NO₂ air quality objectives (AQOs). The development is located within the AQMA.

5.2 Monitoring

- 5.2.1 The nearest NO₂ roadside continuous monitoring site is located on Caversham Road, 1 km to the north of the site. The nearest urban background continuous monitoring location is located 1.8 km east of the development site, at Reading Old Cemetery.
- 5.2.2 It can be seen from data in the 2020 Annual Status Report that from 2015 to 2019, at diffusion tube monitoring stations within the town, there has been a downward trend in NO₂ concentrations at some sites. Across continuous monitoring stations, PM₁₀ levels have shown little change.
- 5.2.3 It can be seen in Table 5.1 that the Caversham Road roadside monitor remained within the AQO for annual mean NO₂ between 2015 and 2019 with the exception of 2018. The hourly mean AQO was also met. The Caversham Road monitor is positioned on a multi-lane busy A road, c. 60m from a roundabout and c. 3m from a pedestrian crossing. This monitoring location will receive much higher NO₂ concentrations in comparison to the pedestrianised and single lane roads adjacent to the development site.
- 5.2.4 The concentrations measured at the urban background monitoring location remained well within the annual and hourly mean NO₂ AQOs in all reported years.

Description	X, Y	Distance from site (km)	Type	2015	2016	2017	2018	2019	AQO
Caversham Road (RD1)	471153, 174429	1.0 km	Roadside	38 (1)	39 (0)	37 (0)	40 (7)	35 (0)	40
Reading AURN (Old Cemetery)	473441, 173198	1.8 km	Urban Background	22 (0)	34 (4)	29 (0)	26 (0)	22 (0)	40

TABLE 5.1: CONTINUOUS MONITORING SITE MEASURED NO₂ CONCENTRATIONS (µg/m³)

Note: Exceedances of the annual mean NO₂ AQO are highlighted in **bold**.

Number of exceedances of the hourly mean NO₂ standard are presented in brackets

- 5.2.5 PM₁₀ is also monitored at both the roadside and urban background monitoring locations detailed above. Table 5.2 shows that the measured annual mean PM₁₀ concentrations remained well within the annual mean and 24-hour AQOs at both monitoring locations in all reported years. Roadside monitoring shows an initial decrease from 2015 and little change for the remaining reported years. Urban background monitoring show no clear trend.



Description	X, Y	Distance from site (km)	Type	2015	2016	2017	2018	2019	AQO
Caversham Road (RD1)	471153, 174429	1.0 km	Roadside	28 (8)	20 (5)	23 (7)	24 (3)	24 (11)	40
Reading AURN (Old Cemetery)	473441, 173198	1.8 km	Urban Background	12 (0)	13 (3)	12 (3)	13 (1)	13 (0)	40

TABLE 5.2: CONTINUOUS MONITORING MEASURED PM₁₀ CONCENTRATIONS (µg/m³)

Note: Number of exceedances of the 24-hour mean PM₁₀ standard are presented in brackets.

5.3 Diffusion Tube Sites

- 5.3.1 RBC also conducts NO₂ monitoring using passive diffusion tubes. The nearest roadside diffusion tube site is located on Friar Street (Nando's), 0.24 km west of the development site and c. 5 m from the kerb. The nearest urban background site is located 1.82 km to the east of the development site, co-located with the Reading AURN automatic monitor at Reading Old Cemetery.
- 5.3.2 The roadside diffusion tube monitoring location is situated c. 5m from the kerbside of Friar St, a two-way road which experiences higher volumes of traffic in comparison to the development site. The eastern façade of the development site is approximately 5m from Market Place road, a one-way road with several bus stops and parking bay for deliveries; However, a parking bay for deliveries lies c.3m from the development site. Market Place road, Friar St and other nearby roads within the town are limited to delivery, taxi and bus vehicles only. The developments northern façade is situated on the pedestrianised area of Town Hall Square and will therefore receive significantly lower NO₂ concentrations.
- 5.3.3 Monitoring data between 2015 and 2019 are presented in Table 5.3, showing that the long-term roadside site exceeded the AQO of 40 µg/m³ for mean annual NO₂ in all reported years. However, the monitoring location shows a clear decreasing NO₂ trend from 2016. The urban background location remained well within the AQO for annual NO₂ in all reported years and has shown little change.
- 5.3.4 The Local Authority guidance TG(16) [19] states that when the annual mean NO₂ concentration at diffusion tube locations is less than 60 µg/m³, the short term (1-hour) objective for NO₂, is unlikely to be exceeded. Annual mean NO₂ concentrations have remained below 60 µg/m³ in all reported years.

Description	X, Y	Distance from site (km)	Type	NO ₂ Annual Mean Concentration (µg/m ³)					
				2015	2016	2017	2018	2019	AQO
Friar Street (Nando's)	471437, 173589	0.25 km	Roadside	47	52	50	42	41	40
Reading AURN (Old Cemetery) Co-located	473467, 173207	1.6 km	Urban Background	18	19	19	19	17	40

TABLE 5.3: DIFFUSION TUBE MONITORING ANNUAL MEAN NO₂ CONCENTRATIONS

Notes: Exceedances of the annual mean NO₂ AQO are highlighted in **bold**.

Exceedances of the 60 µg/m³ NO₂ concentration are highlighted in **bold** and underlined.

5.4 Background Maps

- 5.4.1 Predicted background pollutant concentrations are available from the Defra website for 1 km² grid squares across the UK. Concentrations of NO₂, NO_x and PM₁₀ have been



extracted for grid square centred on 471500, 173500, which overlays the site and are shown in Table 5.4 below. Modelled predictions of mean annual background concentrations are within the AQOs for NO₂ and PM₁₀ in 2020, 2022 and 2023. Each pollutant is predicted to decline in future years.

Pollutant	2020	2022	2023
NO ₂	33.3	32.0	31.5
NO _x	58.1	55.3	54.2
PM ₁₀	18.3	17.8	17.5

TABLE 5.4: PREDICTED BACKGROUND POLLUTANT CONCENTRATIONS (µg/m³)

5.5 Summary of Baseline Conditions

- 5.5.1 The site is located in urban surroundings comprising a mixture of commercial and residential units, with the development site bounded by properties to the south and west. The development has façades facing the pedestrianised Town Hall Square to the north and Market Place to the east.
- 5.5.2 Continuous monitoring data from the available roadside location shows that annual mean roadside NO₂ concentrations remained within the AQO in 2019. NO₂ concentrations remained within the hourly mean AQO in 2019. This monitoring location experiences much higher volumes of traffic compared to the development site, which is situated on a one-way road and only accessible to buses, taxis and delivery vehicles.
- 5.5.3 Pollution levels at the urban background monitoring site remained well within the annual and hourly mean NO₂ in all reported years. PM₁₀ concentrations remained within the annual AQO at both roadside and urban background locations for all reported years.
- 5.5.4 Annual mean NO₂ concentrations recorded at the nearest passive roadside diffusion tube monitoring location exceeded the AQO in all reported years, but shows a strong downward trend from 2016. The diffusion tube is located on a two-way road which experiences much higher volumes of traffic in comparison to the development site, which is situated on pedestrianised and single lane roads, therefore pollutant levels are likely to be lower at the development site.
- 5.5.5 The urban monitoring location showed no clear downward trend in NO₂ over the reported period but has remained well within the 40 µg/m³ annual AQO.
- 5.5.6 Annual mean NO₂ concentrations recorded at the passive urban background and roadside diffusion tube monitoring locations are below 60 µg/m³, which indicates the hourly mean NO₂ objective is unlikely to be exceeded.
- 5.5.7 Modelled Defra background annual mean pollutant concentrations predict that background NO₂ and PM₁₀ levels currently meet the AQO and will decrease by date of operation.
- 5.5.8 In addition, the residential apartments of 27-32 Market Place, facing Market Place road, will be located from the first floor upwards and therefore there will be no residential units at ground floor level. The proposed hotel at 173-175 Friar Street will face the pedestrianised Town Hall Square.



5.5.9 Overall, baseline data indicates that annual NO_2 and PM_{10} concentration objectives are being met at the development site and will continue to do so.



6. CONSTRUCTION IMPACTS

6.1 Methodology

- 6.1.1 This assessment of potential demolition and construction impacts follows the assessment procedure in the EPUK guidance and the IAQM guidance on the assessment of dust from demolition and construction.

6.2 EPUK Screening for Construction Traffic

- 6.2.1 The number of HGV movements during the construction period will be less than 25 per day, which is below the EPUK screening criterion and does not require further assessment.

6.3 Dust and Emissions Screening

- 6.3.1 An assessment of construction dust and emissions is required as there are human receptors within 50 m of the site and 50 m of the likely construction vehicle routes to and from site. As there are human receptors within 50 m of the site, human health impacts and dust soiling are considered in this assessment. There are no ecological receptors within 50 m of the site and so ecological receptors are not considered further in this assessment.

6.4 Magnitude of Dust Emissions

- 6.4.1 Quantities and magnitude classifications used below correspond to those in IAQM guidance [16].

Demolition

- 6.4.2 173-175 Friar Street will be demolished to clear the site for the development, representing a total building volume of less than 20,000 m³. The properties are fabricated from brick and concrete and therefore have a medium potential for dust release. The site is considered to have a 'Medium' dust emission magnitude for demolition.

Earthworks

- 6.4.3 The total area of the site is approximately 2,500 m² with a soil type formed of Taplow Gravel (sand and gravel) [21] with a low potential for dust release. The site is considered to have a 'Small' dust emission magnitude for earthworks.

Construction

- 6.4.4 The total building volume to be constructed is estimated to be between 25,000-100,000 m³, with the construction involving potentially-dusty construction materials, including bricks and concrete. The site is considered to have a 'Medium' dust emission magnitude for construction.

Trackout

- 6.4.5 The number of HGVs outward is predicted to be between 10 and 50 per day. In light of this, the site is considered to have a 'Medium' dust emission magnitude for trackout.



Activity	Dust Emission Magnitude
Demolition	Medium
Earthworks	Small
Construction	Medium
Trackout	Medium

TABLE 6.1: DUST EMISSION MAGNITUDE

6.5 Sensitivity of the Area

- 6.5.1 Residential receptors, which have a high sensitivity to dust soiling and health effects, are potentially located within 20 m of the proposed development, at the adjacent properties at 164-171 Friar Street, 23-26 Market Place and 33-34 Market Place. There are estimated to be fewer than 10 residential receptors within 20 m of the site, and between 10 and 100 within 50 m of the site, as a conservative estimate.
- 6.5.2 There are 10 to 100 receptors with a high sensitivity to dust soiling and health effects within 20 m of the trackout route. Nearby receptors are a mixture of commercial and residential receptors, which have a high sensitivity to dust soiling and health effects.
- 6.5.3 The sensitivity of the area to dust soiling effects is defined as 'Medium' for demolition, earthworks and construction activities, and 'High' for trackout activities, due to the number and proximity of sensitive receptors. This is summarised in Table 6.2.
- 6.5.4 The sensitivity of the area to human health impacts is defined as 'Low' for the demolition, earthworks, construction and trackout activities, due to the number and proximity of sensitive receptors and a predicted background annual mean PM₁₀ concentration (see Table 5.4) of <24 µg/m³ in the vicinity of the site. This is summarised in Table 6.2.

Sensitivity of the Area	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	Medium	High
Human Health	Low	Low	Low	Low

TABLE 6.2: SENSITIVITY OF THE AREA ASSESSMENT

6.6 Dust Risk

- 6.6.1 The likely risk of dust effects, based on the contents of Table 6.1 and 6.2, at nearby sensitive receptors without mitigation in place is summarised in Table 6.3. There is a 'Medium' risk from demolition, construction and trackout activities causing dust soiling effects at local receptors, with a 'Low' risk from earthwork activities. There is a 'Low' risk of health effects from demolition, construction and trackout activities with a 'negligible' risk from earthwork activities.



Summary	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium Risk	Low Risk	Medium Risk	Medium Risk
Human Health	Low Risk	Negligible	Low Risk	Low Risk

TABLE 6.3: SUMMARY DUST RISK CATEGORY

6.7 Mitigation

- 6.7.1 The SPG guidance details that the dust risk assessment should inform an Air Quality and Dust Management Plan, to confirm the dust and air quality emission control measures to be implemented, confirm that NRMM standards will be met and to confirm monitoring methods and complaint response procedures. The air quality and dust management plan may form part of a Construction Environmental Management Plan (CEMP).

6.8 Residual Impacts

- 6.8.1 With appropriate mitigation in place, any dust impacts will be minimised.



7. OPERATIONAL IMPACTS

7.1 Methodology

- 7.1.1 This assessment of potential operational impacts follows the assessment procedure in the EPUK guidance.

7.2 EPUK Screening

- 7.2.1 The proposed development comprises a 182 room hotel (C1), residential apartments (C3) and retail space (A1). The floor space is more than 1,000 m². It therefore meets the initial EPUK criterion.
- 7.2.2 There will be no on-site parking spaces associated with the development. The hotel development will provide 10 cycle spaces in a lit, secure and sheltered location.
- 7.2.3 The energy plant for the development has not yet been confirmed. However, MAXXflo EVO condensing water heaters have been proposed.

Traffic

- 7.2.4 There will be no on-site parking spaces associated with the development. The annual average daily traffic (AADT) for the development has been calculated to be less than 100 vehicles, which does not meet the EPUK criteria for further assessment.

Energy Plant

- 7.2.5 The exact model is currently not confirmed; however, the proposed plant is anticipated to have a combined NO_x emission rate of less than 5 mg/s which is below the EPUK guidance criterion that would trigger further assessment.¹ If the final plant model is found to have an emission rate of greater than 5 mg/s this may require future assessment to determine whether there would likely be air quality effects from the plant.

7.3 New Receptors

- 7.3.1 The proposed development will introduce new residential and commercial receptors. Baseline conditions indicate that NO₂ and PM₁₀ objectives are currently being met and will continue to be met by the anticipated operational dates of December 2022 and June 2023. Therefore, the proposed development will not introduce new receptors into an area where objectives are breached and the site is appropriate for the proposed use.

¹ This 5 mg/s criterion equates to a 450 kW ultra-low NO_x gas boiler or a 30kW CHP unit operating at <95mg/Nm³.



8. MITIGATION

8.1 Construction

- 8.1.1 Under best-practice guidance, the proposed development constitutes a 'Medium' risk for demolition and earthwork dust during construction activities.
- 8.1.2 Impacts associated with the proposed development are likely to be in the form of dust generated primarily during demolition and construction phase activities. The use of appropriate mitigation measures throughout the demolition and construction periods will ensure that impacts to sensitive receptors are minimised or removed.
- 8.1.3 Based on the results of the dust risk assessment, it is recommended that the following general best-practice measures (taken from the IAQM, Guidance on the Assessment of Dust from Demolition and Construction [16]) be adopted and included in a construction environmental management plan (CEMP).

Management Category	Mitigation Measure
Site Management	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
	Develop a Dust Management Plan.
	Display the name and contact details of person(s) accountable for air quality pollutant emissions and dust issues on the site boundary.
	Display the head or regional office contact information.
	Record and respond to all dust and air quality pollutant emissions complaints.
	Make a complaint log available to the local authority when asked.
	Carry out regular site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to the local authority when asked.
	Increase the frequency of site inspections by those accountable for dust and air quality pollutant emissions issues when activities with a high potential to produce dust and emissions and dust are being carried out, and during prolonged dry or windy conditions.
	Record any exceptional incidents that cause dust and air quality pollutant emissions, either on or off the site, and the action taken to resolve the situation is recorded in the log book.
Preparing and maintaining the site	Plan site layout: machinery and dust causing activities should be located away from receptors.
	Erect solid screens or barriers around dust activities or the site boundary that are, at least, as high as any stockpiles on site.
	Fully enclosure site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
	Avoid site runoff of water or mud.
	Keep site fencing, barriers and scaffolding clean using wet methods

TABLE 8.1: RECOMMENDED MITIGATION



Management Category	Mitigation Measure
Preparing and maintaining the site	Remove materials from site as soon as possible.
	Cover, seed or fence stockpiles to prevent wind whipping.
	Put in place real-time dust and air quality pollutant monitors across the site and ensure they are checked regularly.
	Agree monitoring locations with the Local Authority.
	Put in place real-time dust and air quality pollutant monitors across the site and ensure they are checked regularly.
Operating vehicle/machinery and sustainable travel	Ensure all vehicles switch off engines when stationary – no idling vehicles.
	Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where possible.
	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
	Ensure an adequate water supply on the site for effective dust/particulate matter mitigation (using recycled water where possible).
	Use enclosed chutes, conveyors and covered skips.
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste Management	Reuse and recycle waste to reduce dust from waste materials
	Avoid bonfires and burning of waste materials.

TABLE 8.1: (CTD) RECOMMENDED MITIGATION



Management Category	Mitigation Measure
Measures Specific to Demolition	Ensure water suppression is used during demolition operations.
	Avoid explosive blasting, using appropriate manual or mechanical alternatives.
	Bag and remove any biological debris or damp down such material before demolition.
Measures Specific to Construction	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place
Measures Specific to Trackout	Regularly use a water-assisted dust sweeper on the access and local roads, as necessary, to remove any material tracked out of the site.
	Avoid dry sweeping of large areas.
	Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport.
	Record all inspections of haul routes and any subsequent action in a site log book.
	Access gates to be located at least 10m from receptors where possible.

TABLE 8.1: (CTD) RECOMMENDED MITIGATION

8.2 Operational

Traffic

There will be no on-site parking associated with the development.

Energy Plant

- 8.2.1 Energy plant for the development has not yet been confirmed. However, MAXXflo EVO Condensing Water Heaters have been proposed. The energy plant will be specified at the detailed design stage to ensure compliance with EPUK guidance.

New Receptors Introduced by the Proposed Development

- 8.2.2 The site was formerly a commercial unit, whereas the proposed development will be a mixed-use residential and commercial building and will therefore introduce new residential receptors. Baseline conditions indicate that NO₂ and PM₁₀ AQOs are being met and will continue to be met by the proposed operational dates of December 2022 and June 2023. Therefore, the proposed development will not introduce new receptors into an area where objectives are breached and no mitigation of air pollution levels for introduced receptors is required.



9. CONCLUSIONS

- 9.1.1 The assessment indicates that baseline air quality conditions at the development site and nearby existing receptors will meet the NO₂ and PM₁₀ national objectives. New receptors will, therefore, not be introduced into an area breaching air quality objectives in the proposed first operational years of 2022 and 2023.
- 9.1.2 The results of the dust risk assessment indicate that construction activities may have, at worst, medium air quality impacts at nearby receptors without mitigation. These impacts can be minimised or removed through the implementation of a construction phase dust management plan detailing the appropriate mitigation measures and dust monitoring. Appropriate mitigation has been identified in Section 8 of this report.
- 9.1.3 There will be a negligible impact on local air quality from construction and operational traffic, due to the very low number of vehicle movements during construction and operation. No mitigation is necessary.
- 9.1.4 The energy plant within the proposed development is likely to have a negligible impact on local receptors. If the final specification for the energy plant has an emission rate greater than 5 mg/s, assessment of the chosen boiler plant may be required.
- 9.1.5 Overall, the air quality effects from the proposed development are considered to be not significant and there is no conflict with relevant national, regional or local policy.



10. REFERENCES

1. Moorcroft and Barrowcliffe. et al. Land-use Planning & Development Control: Planning for Air Quality. Institute of Air Quality Management & EPUK, London. 2017.
2. Council Directive 2008/50/EC of 21 May 2008 on ambient air quality and cleaner air for Europe. Official Journal of the European Union. Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe. 11.6.2008.
3. SI 2010 No. 1001. The Air Quality Standards (England) Regulations 2010. HMSO
4. SI 2016 No. 1184. The Air Quality Standards (Amendment) Regulations 2016. HMSO.
5. Defra. 2017. Air Quality Plan for Nitrogen Dioxide (NO₂) in UK (2017). Available from <https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017#history>
6. SI 2015 No. 0000. Environmental Protection, England. The Air Quality (England) Regulations 2015. HMSO.
7. Office of the Deputy Prime Minister. 1995. The Environment Act.
8. Defra. 2019. Clean Air Strategy 2019. HMSO.
9. 1990 c.43. Environmental Protection Act. HMSO.
10. 1993 c.11. Clean Air Act 1993. HMSO
11. Ministry of Housing, Communities and Local Government. National Planning Policy Framework. February 2019.
12. Ministry of Housing, Communities and Local Government. 2019. Planning Practice Guidance: Air Quality. [Online] <https://www.gov.uk/guidance/air-quality--3>. Accessed September 2020.
13. SI 1927. The Conservation of Habitats and Species (Amendment) Regulation 2012.
14. Reading Borough Council. 2019. Reading Borough Local Plan. Adopted November 2019.
15. Reading Borough Council. 2016. Air Quality Action Plan Update.
16. Institute of Air Quality Management (IAQM). 2014. Guidance on the Assessment of Dust from Demolition and Construction. Version 1.1. 01/06/16.
17. Reading Borough Council. 2020. Air Quality Annual Status Report 2019.
18. Department for Environment, Food and Rural Affairs. (Defra). Background mapping for local authorities. [online] <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>. Accessed September 2020.
19. Department for Environment, Food and Rural Affairs (Defra). 2018. Local Air Quality Management. Technical Guidance (TG16). February 2018.



20. British Geological Survey. 2017. Geology of Britain Viewer. Natural Environment Research Council. <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>. Accessed October 2020.

APPENDIX A: FIGURES

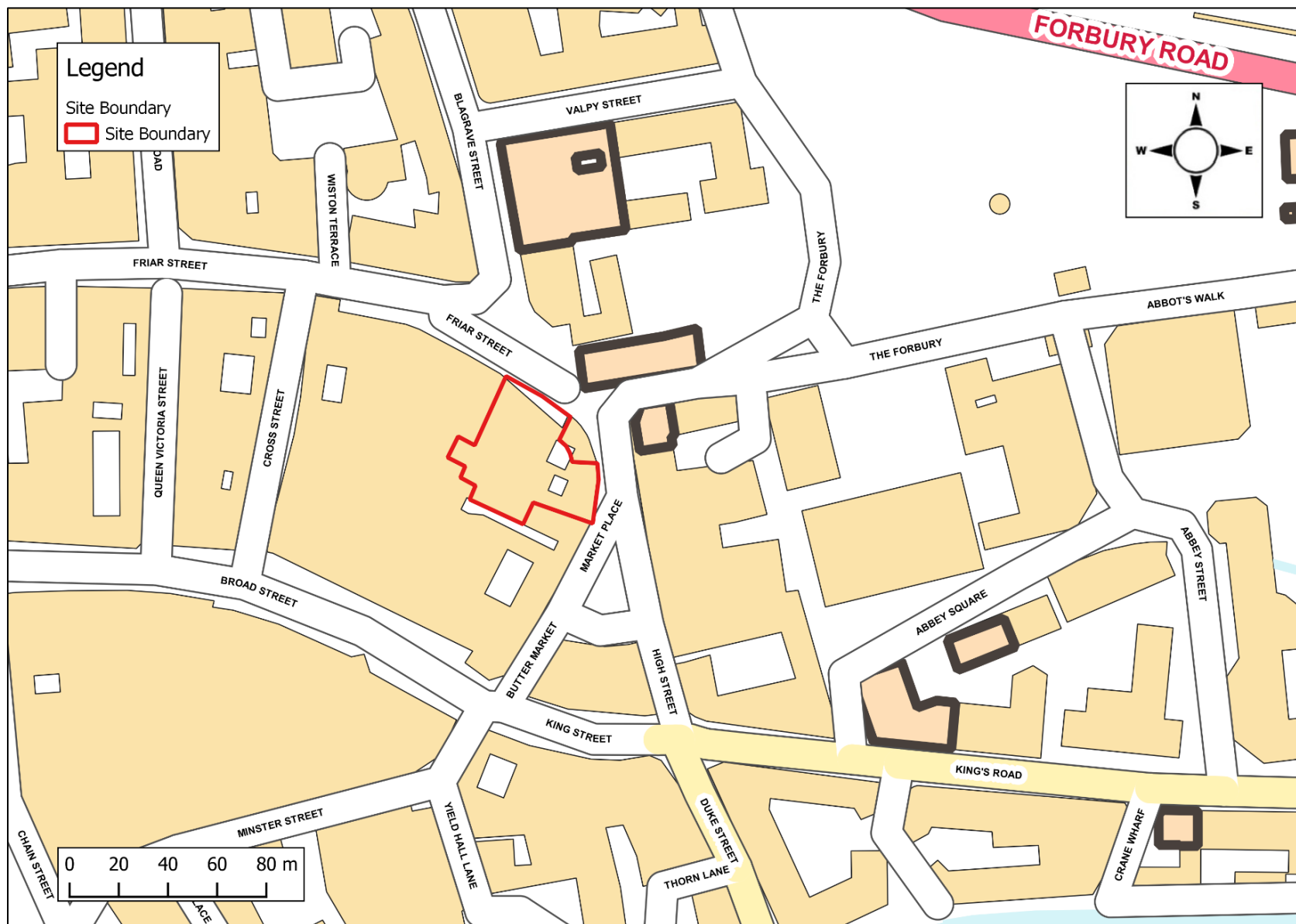


FIGURE A1: SITE LOCATION



FIGURE A3: 73-75 FRIAR STREET PROPOSED FLOOR PLANS – GROUND FLOOR



FIGURE A4: 73-75 FRIAR STREET PROPOSED FLOOR PLANS – 1ST FLOOR



FIGURE A5: 73-75 FRIAR STREET PROPOSED FLOOR PLANS – 2ND FLOOR



FIGURE A6: 73-75 FRIAR STREET PROPOSED FLOOR PLANS – 3RD FLOOR



FIGURE A7: 73-75 FRIAR STREET PROPOSED FLOOR PLANS – 4TH FLOOR



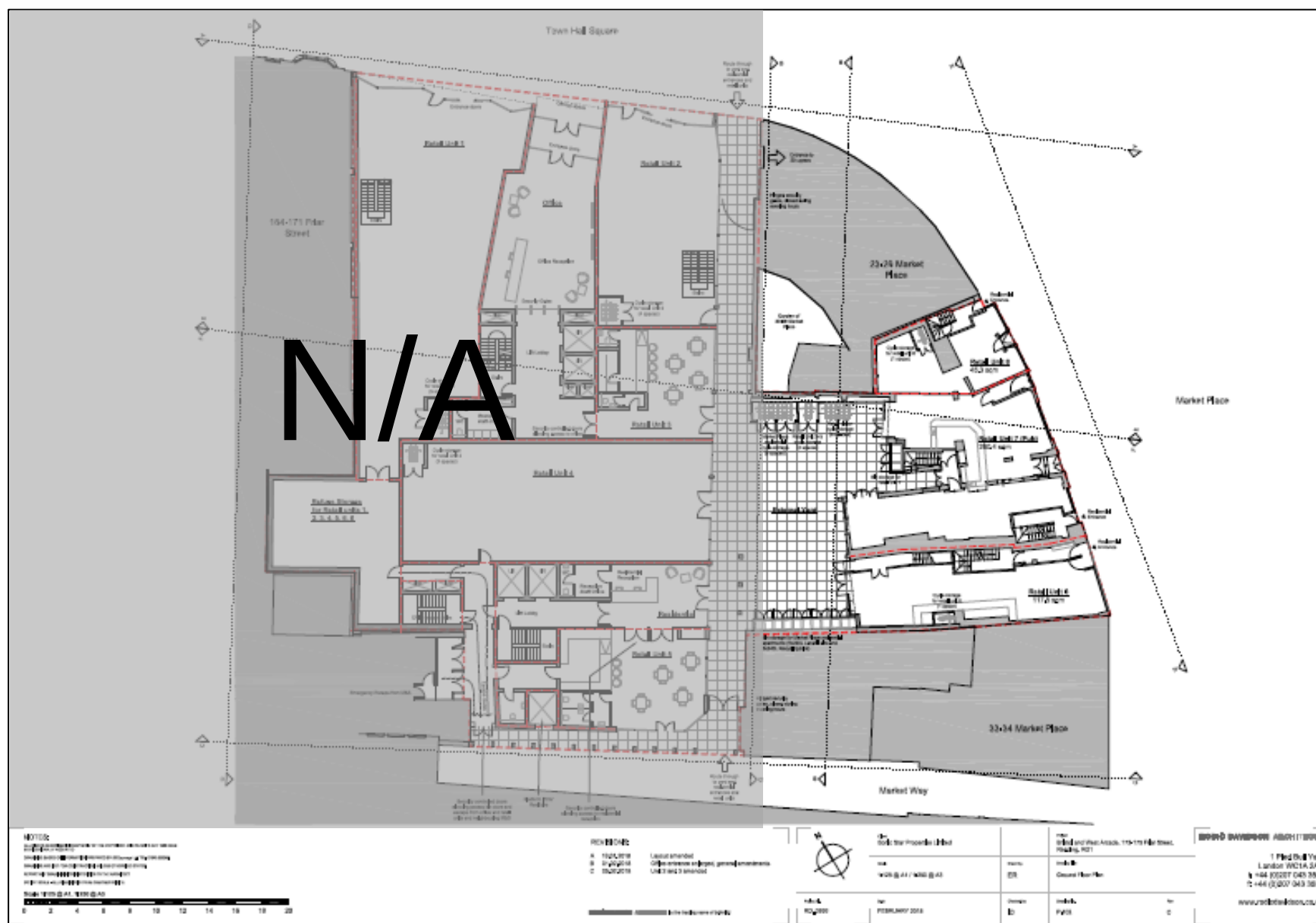
FIGURE A8: 73-75 FRIAR STREET PROPOSED FLOOR PLANS – 5TH FLOOR



FIGURE A9: 73-75 FRIAR STREET PROPOSED FLOOR PLANS – 6TH FLOOR



FIGURE A10: 73-75 FRIAR STREET PROPOSED FLOOR PLANS – 7TH FLOOR



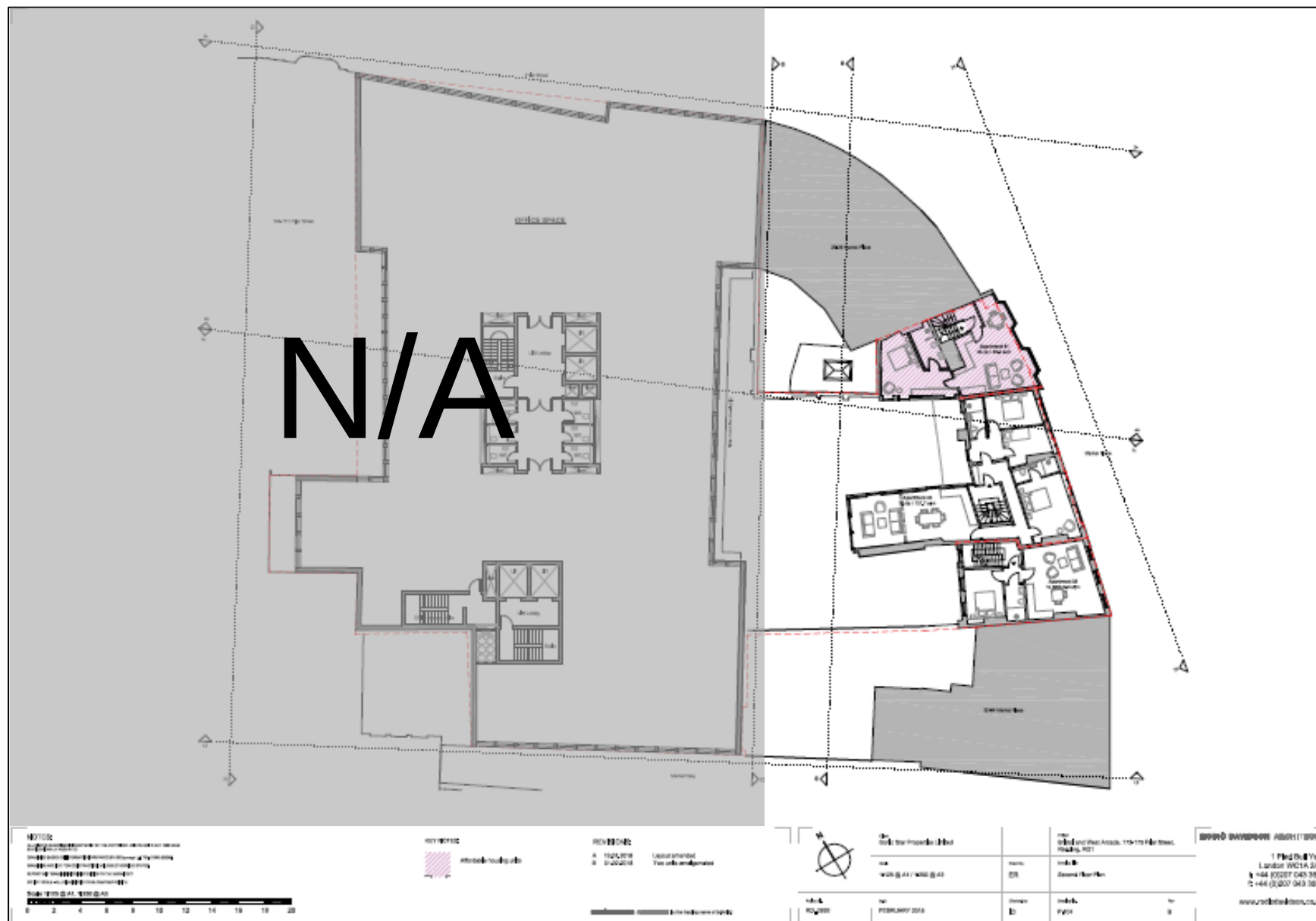


FIGURE A14: 27-32 MARKET PLACE PROPOSED FLOOR PLANS – 2ND FLOOR

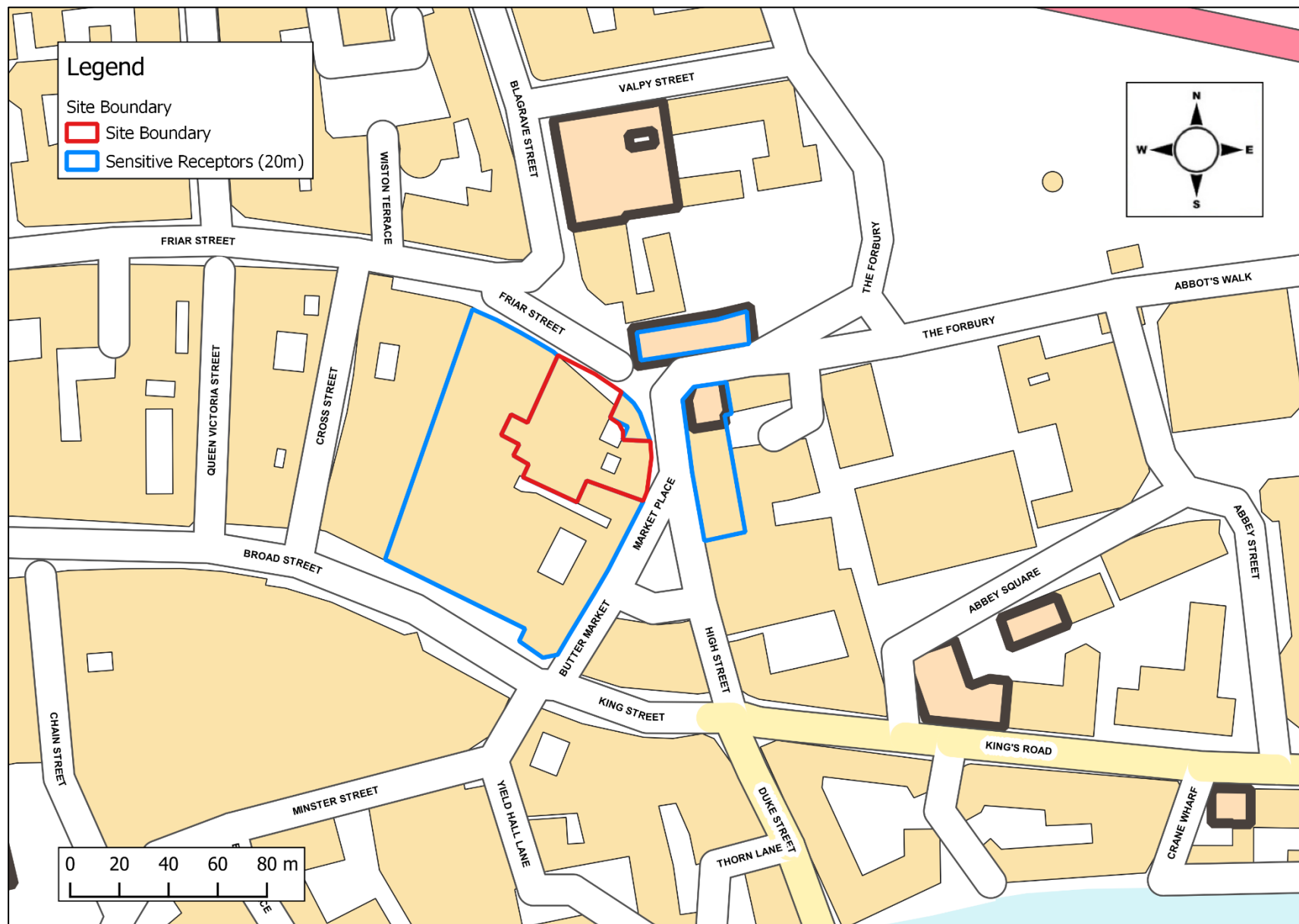


FIGURE A16: SITE LOCATION WITH SENSITIVE RECEPTORS

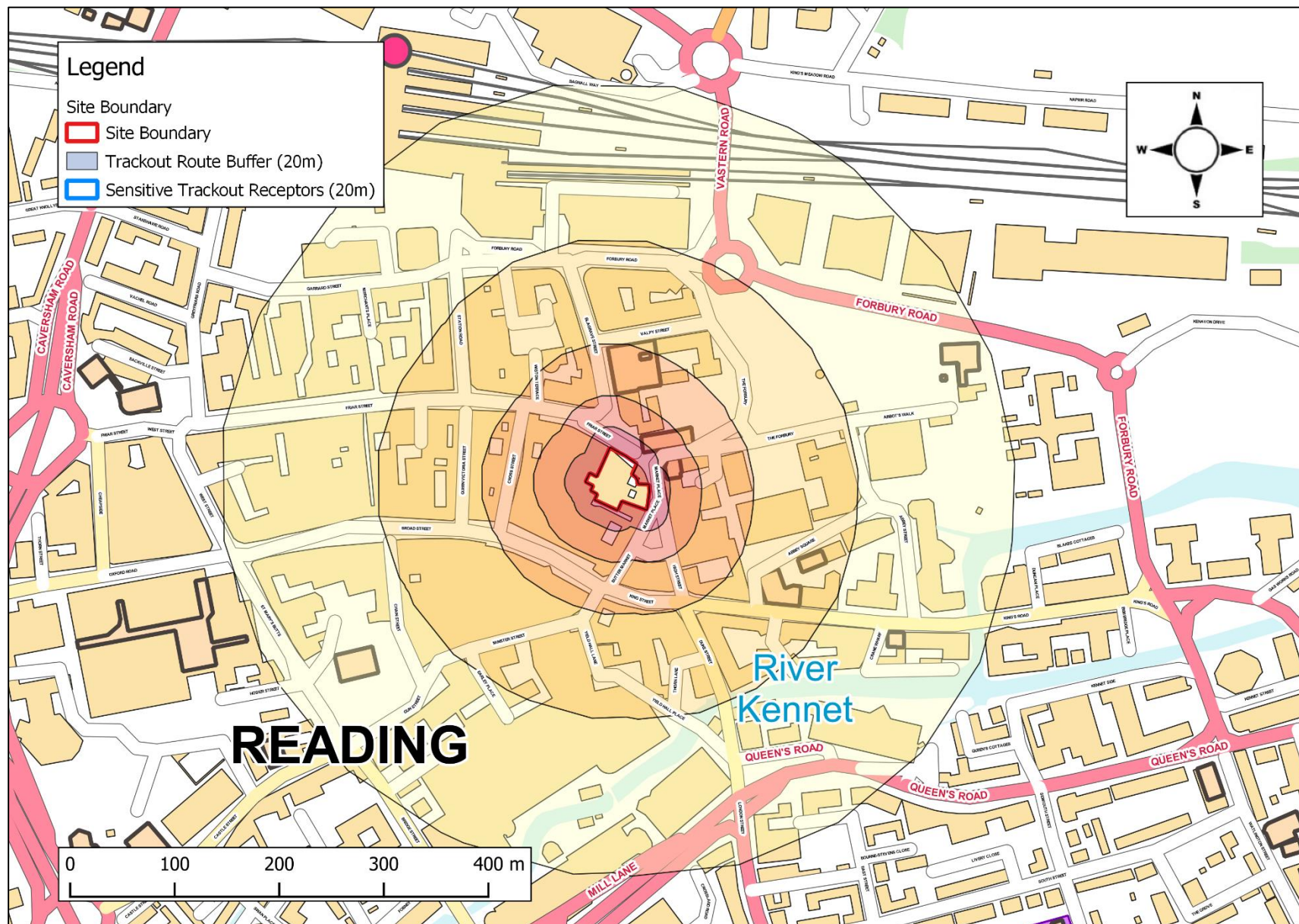


FIGURE A17: DUST RISK BUFFER

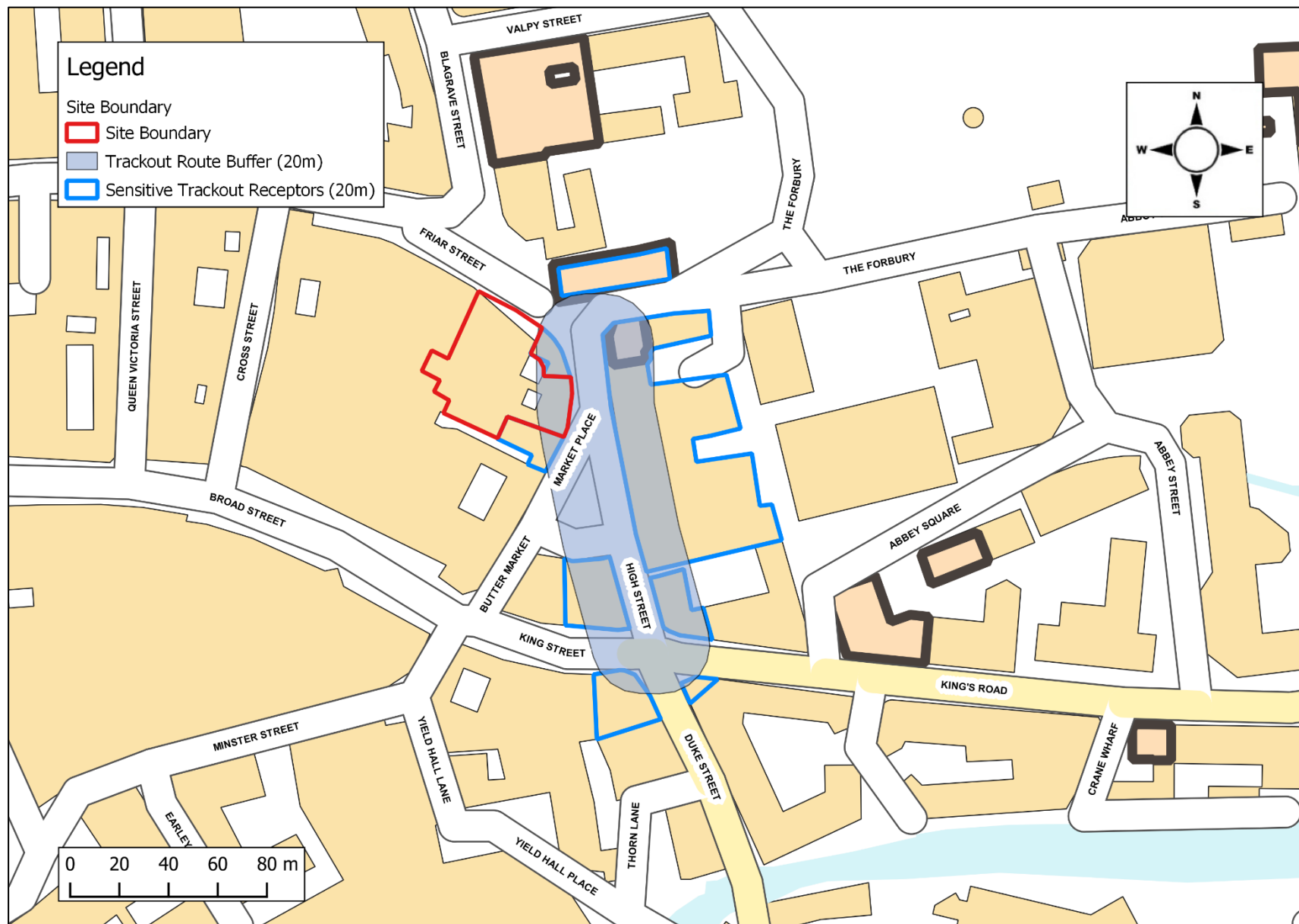


FIGURE A18: 20M TRACKOUT DUST RISK BUFFER